

The Ortolan and Cretzschmar's Buntings: an ornithological enigma (Aves, Emberizidae)

by

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Introduction

It was on 22nd May, 1969 that my interest in the relationship between the Ortolan Bunting *Emberiza hortulana* and Cretzschmar's Bunting *Emberiza caesia* received an initial stimulus. At that time, as assistant chauffeur, cook, free-lance collector on behalf of my colleagues of anything growing, crawling, jumping or swimming that caught my fancy and, more particularly, as observer of the avifauna, I was privileged to take part in an expedition to southern Yugoslavia under the leadership of Dr. Kurt Bauer of the Museum of Natural History in Vienna. The team included a botanist.

The principal objects of the expedition were to study and collect specimens of the fauna and flora and to locate and record the avifauna at heights of and above 1,500 metres.

On the date in question, having pitched camp in a small valley on the col separating Lakes Ochrid and Prespo on the border of Albania at approximately 1,500 metres altitude, we encountered our first *hortulana* which were obviously settling in, so to speak, in their nesting territory. There were still substantial patches of snow just above this level.

The birds were restless, there was much chasing, and opportunities for observation for more than a second or two at a time were strictly limited. Dr. Bauer already knew both *E. hortulana* and *E. caesia*, whereas my own knowledge up to then was limited to *E. hortulana*. In any case, we both formed a quick impression, independently, that one of the birds was a male *E. caesia*. This would have been a significant record in that our location was almost exactly on the northernmost latitude normally accepted for this species.

In the course of the next three days at this site I paid particular attention to the Emberizidae but have to acknowledge that every individual seen to advantage was identified as *E. hortulana*. One of the intriguing aspects of these observations was the remarkable variability of the birds' songs, and thereafter I made notes in detail at this location and subsequently of the songs of 350 examples heard, all of them, presumably, *hortulana* as

those identified were, without exception, of this species. At that time I had hoped that encounters with *E. caesia* would afford opportunities for a detailed comparison between the songs but, unhappily, such an opportunity did not present itself until June, 1974 during a visit to Cyprus.

It transpired in the event that voice may indeed prove to play an important part in their peculiar relationship to one another.

In the years between, research in the available literature disclosed some remarkable anomalies in the assessment of this relationship. The purpose of the present article is to examine these and, where possible, to clarify them, taking into consideration questions of distribution, habitat, behaviour and means of identification, all of which have a bearing on the final analysis.

Distribution

The summer range of *Emberiza hortulana* reaches from Portugal in the west to western Mongolia in the east, and from near the Arctic Circle in Finland in the north to the Dead Sea in the south (Witherby, H. F. et al. 1949) *E. caesia* has a much more limited scope around the eastern end of the Mediterranean "with the centre of gravity of its distribution in the Arnik Gölü area of Asia Minor" (E. Curio 1961). From west to east it ranges from Corfu into the Taurus Mountains, Syria and Lebanon. The normally accepted northern limit of its breeding territory is at the Gulf of Orfani, Greece (latitude of Saloniki) and in the south, Palestine.

It is perhaps as well to note at this point that the breeding distribution given by H. Heinzel et al. (1972) takes *caesia* as far north as the Dalmatian coast of Yugoslavia, probably on the authority of Ch. Vaurie (1959), also cited by R. Dennis (1969). However, A. Mastrovic (1942) states categorically in his "Birds of the Croatian Coastal Region" that "*E. caesia* is absent from the area under review", while S. D. Matvejev and J. V. F. Vasic (1973) omit any mention of the species in their comprehensive survey of Yugoslavia. Our own expedition of 1968 took us through Dalmatia from south to north without uncovering a single *E. caesia* there.

Habitat

Both Seeböhm and Krüper (cited in Reiser 1905) describe *hortulana* as a breeding species of the evergreen tree regions of the mountains; Stresemann (1920) quotes L. Müller as having observed *hortulana* in hill areas with many bushes and sparse trees; according to Meinerzhagen (1954), *hortulana* is to be found "in both cropland and rocky hill slopes"; while Steiner and Hüni-Luft state that, in Lower Austria, *hortulana* "inhabits agricultural land with alleys of fruit-trees". The citations are, of course, restricted to the areas under review by the respective commentators and are not to be taken as wide generalisations.

Kumerloeve (1961) speaks of *caesia* as being invariably to be found in "built-up areas with fruit trees". In the early part of June, i. e. towards the end of its breeding season in Cyprus, I found *caesia* singing in grain crop areas, in groves of olive trees and also in the dry, stony eastern Mediterranean scrub terrain in the foothills of the Kyrenian Mountains. It seems clear that, where the two species have free reign, each is capable of thriving in all sorts of biotopes from sea level to heights between 1,700 and 2,000 metres. Kumerloeve (1967) describes *hortulana*, for example, as "a common bird in thickets and oak coppices" near Samsun Mersifan on the south coast of the Black Sea, while I have seen *caesia* only a couple of hundred metres from the sea on the coast of Kyrenia in northern Cyprus. We found *hortulana* in substantial numbers in the relatively bare mountains of southern Yugoslavia up to 2,000 metres, while the Cyprus Ornithological Society Bird Reports show *caesia* as breeding at least as high as 1,700 metres in the Troödos Mountains.

Behaviour

E. hortulana is "a rather quiet, secretive bird". (Witherby, G. F. et al. 1949). It is "very much a ground bird although it will frequently settle on bushes" . . . *E. caesia* is "even more of a ground bird than the ortolan", but will "perch freely on trees when alarmed". (R. Meinerzhagen 1954). According to Kumerloeve (1961) *caesia* stays on the ground, while *hortulana*, "as is well known, likes to perch on the tips of trees". Of the forty or so *E. hortulana* observed singing in May, 1969 above Lake Ochrid in southern Yugoslavia I noted only three occasions of perching on bushes, of which there was quite a sprinkling in the area. In Austria, *hortulana* commonly sings from fruit trees by the roadside. On Cyprus, near Morphou in the north-west of the island, I watched an *E. caesia* singing from the tip of a 4-feet high weed between two fields of wheat.

P. Gérondet in U. Glutz von Blotzheim (1962) describes *E. hortulana* as "often very localised, in colonies". My own experience leads me to conclude that both *hortulana* and *caesia* tend to breed in concentrations rather than in colonies in the sense in which one would use the word, for example, in referring to "colonies" of flamingoes, gannets, rooks or Spanish sparrows. One does come across occasional pairs of both species breeding in complete isolation from their fellows; while I have found as many as eight male *hortulana* singing at the same time (each perched in what, to me, became the typical stance with head retracted, in a crouching position like a submissive female, bill tilted upward, and invariably just below the tip of the boulder) in a sort of amphitheatre of boulders not more than eighty metres across, on a plateau near the coast of Yugoslavia west of Titograd. In Cyprus, on the coast of the province of Kyrenia, there

were eighteen *caesia* singing in an area covering a stretch of some 500 metres of cart track leading into the Kyrenian foothills.

Identification

a) Plumage

"In July, 1894 I shot a male *hortulana* which, in its 'worn' plumage, bore a remarkable resemblance to *caesia*". (O. Reiser 1905). R. Dennis, in giving some useful points of identification when examining birds in the hand, acknowledges that differentiation becomes difficult in the field apart from adult summer birds (1969). In the collection of the Museum of Natural History in Vienna, there are 41 skins of *E. hortulana* and 21 of *E. caesia*, unfortunately with no autumn females of the former and no examples whatsoever of autumn *caesia*. Even in the hand, distinguishing between the two summer females is by no means immediate, the difference lying chiefly in the pastel shades of blue-grey and green-grey respectively and in the slightly more pronounced flecks or streaks on the flanks of the female *caesia*. The juveniles of the two species are to all intents and purposes indistinguishable, even in the hand. The adult males of both species have a pale eye-ring.

In favourable circumstances, including good light, I found that the breeding plumages of the males are quite readily distinguishable, the soft blue-grey of *caesia* in particular being noticeable compared with the dingier greenish-grey of *hortulana*. These "favourable circumstances", however, are very much the exception in the case of *caesia* with its almost totally terrestrial habits during the breeding period: it even delivers its song from the ground with few exceptions. When disturbed it does sometimes fly to the top of a small tree or bush, but even then remaining for a brief period only.

b) Song

"*Caesia* has an Ortolan-like 'ci-ci-ci-cā' and 'di-di-di-dī'" (W. Banzhaf 1937). (The observer) "will soon learn to differentiate between *caesia*'s short song and that of every other bunting" (A. Mastrovic 1942). "*Caesia*'s song reminded us vividly of the Ortolan — a rather soft 'tit-it tüt' or ti-ti-ti-tüh' of three to five syllables" (O. Steinfatt 1954). "Their (*caesia*) song is on the whole thinner than that of the Ortolan" (H. Kumerloeve 1962). To my own ear — and the aural registration of bird song is essentially subjective — Kumerloeve comes very near the mark. *Hortulana*'s song appeals to me as having appreciably more tonal quality than *caesia*'s and is thus adaptable to much wider variations. One of my notes on a *caesia* song is "thin and scratchy" — a description which would not fit any *hortoulana* song I have heard. But, again, it is dangerous, as in other aspects of

comparison between the two species, to generalise as I encountered two singing *caesia* with a noticeably musical content in their song, higher, clearer and "rounder" than the others, but still thinner than most *hortulana* songs. *Caesia*, as it were, plays the oboe to *hortulana*'s clarinet. Finally, the prolonged note (occasionally notes) constituting the definitive characteristic at the end of the songs of both species seemed, to my ear, in the case of *caesia* to be pitched at its deepest only half a tone lower than the short, introductory notes, compared with $1\frac{1}{2}$ to $2\frac{1}{2}$ tones lower in the case of *hortulana*.

c) Nests and Eggs

D. A. and W. M. Bannerman in their "Birds of Cyprus" include under the heading "Cretzschmar's Bunting" several detailed descriptions of this species' nests which could apply equally to those of *hortulana*, both in structure and siting. It seems, too, that the description of the eggs of one species could also be that of the other. A case is cited where eggs presumed by the finder, described as a competent ornithologist, to be those of a *hortulana*, collected in Cyprus in 1914, were sent for examination to F. C. R. Jourdain, then the acknowledged expert on the eggs of European birds. In a paper "The Breeding Birds of Cyprus" in the "Journal für Ornithologie", 1929, supplement, Jourdain wrote that confirmation of this record as *hortulana* was required. In fact, there has been no such confirmation nor any further report of *hortulana*'s breeding on the island.

d) General

During the actual breeding period differentiating between the two is simplified, of course, by their mutual exclusiveness which then becomes an apparently infallible factor in identification. The problem in spring and autumn, when both species are in passage, is potentially more complicated as both may be found in fairly close proximity at the same time (e. g. in Corfu, Carpathos and Cyprus) both ante and post breeding.

In this connection, the records of the Cyprus Ornithological Society of sightings of birds of passage are particularly interesting in that substantial numbers of both species are recorded in spring and autumn, without mention of any problem of identification. *Hortulana*, for example, is reported in the Society's Second Bird Report, 1971 as "many" on the 4th, c. 30 on the 17th and c. 20 on the 26th, 29th and 30th April respectively, while 28 sightings of *caesia* are noted, with groups of 10 on the 26th and 20 on the 27th March, with 40 on the 4th and c. 100 on the 5th April respectively!

A similar movement, in much more modest numbers, occurs during the autumn passage from mid-August to early September, a time when, as we have seen, identification becomes really difficult. It is all the more surprising that both species are reported in the two movements in the same areas, chiefly in the south of the island.

In only two instances is dubiety expressed about identification, one a female *caesia* reported on 29th November and 5 *hortulana* on the 4th December.

Exclusiveness

Here, then, are two species so very closely related that F. Peus (1954) regards their relationship as a taxonomic problem. Experienced ornithologists find them difficult to distinguish in the field, with similar plumage, identical habitat, indistinguishable nests and eggs, songs very reminiscent one of the other in structure and content, behaviour little different, both occurring as breeding species from sea-level to around 2,000 metres altitude, and both subsisting on a diet of seeds and insects.

Other such closely related species in similar circumstances not infrequently resolve their differences by inter-breeding — one thinks, for example, of the Yellow- and Red-shafted Flickers *Colaptes auratus* and *C. cafer* of North America; of the Yellow Wagtail (*Motacilla flava* group) in Europe generally; and of the Great-spotted Woodpecker *Dendrocopos major* and the Syrian Woodpecker *Dendrocopos syriacus* in Austria. In the present instance, however, exactly the opposite is the case in that a rule of segregation applies as rigidly as Wolfgang Pauli's Nobel prize-winning "exclusion principle" regarding electrons — where one is, the other cannot be!

Much has been written about the detailed distribution of *hortulana* and *caesia* on the islands of the eastern Mediterranean and it is unquestionably a fascinating phenomenon. Of the larger islands on the southern limits of the area, the most south-westerly, Crete, is the exclusive preserve of *hortulana* at all levels (G. Mauersberger 1960). In the most south-easterly, Cyprus, at very nearly the same latitude, *caesia* is the sole breeding species. In the north-west, Corfu belongs to *caesia*, while in the north-east Samothrace, at almost the same latitude, belongs to *hortulana*. All of the Aegean Islands between, including Rhodes, have been taken over exclusively by *caesia* with the exception of one or two of the smaller ones which are inhabited by neither.

On the mainland of Asia Minor there is segregation by altitude, with the line of demarcation between 600 and 900 metres — *hortulana* above, *caesia* below. (H. Kumerloewe 1961 and 1967).

On the mainland of Greece this vertical separation is repeated on the Peloponnese (Mauersberger 1960), but where the altitudinal scope is insufficient in Macedonia they have separated themselves, as Peus (1957) puts it, according to „different physiognomic structure of biotopic space". In Cyprus where, for a short time in spring including actually the early part of *caesia*'s nesting time, both species are present in the same areas, it seems that they even then separate themselves by groups, with no *caesia* in flocks of *hortulana* and vice-versa (Cyprus Ornithological Society Reports 1970 to 1972).

F. Peus and G. Niethammer in particular have applied themselves to the examination of this phenomenon but they disagree substantially in their analyses of the reasons. Niethammer suggests that they are competing species and that the "central European" *hortulana* has found it impossible to infiltrate the territory of the "Mediterranean" *caesia*; it must therefore content itself with the areas which the latter has not occupied. His approach to the question in this respect is that *caesia* is the indigenous („eingesessene") species and, by inference, *hortulana* the interloper. He expresses the further opinion that the two species are ecologically mutually exclusive, with *hortulana* dendrophile and *caesia* xerophile. This last suggestion is, on the history, greatly over-simplified and has validity only in a very limited sense where the two species breed, as in Greek Macedonia, in fairly close proximity to one another and there is insufficient range of altitude to separate themselves vertically. F. Peus's explanation of the same circumstance is that the decisive factor then becomes one of biotopes, with *hortulana* occupying the lush areas and *caesia* the more arid ones; but he sees in this no ground for a wider generalisation where altitude or ocean is the factor in separation.

Discussion

With two species obviously so very closely related as is here the case, inter-breeding would call for no explanation. But what of total repudiation?

Hortulana's widespread range tends to suggest that it is the hardier, more versatile and more enterprising of the two and yet, where they impinge in a limited area such as Cyprus, or in most of the Greek islands, it is *caesia* which is left in sole possession, apparently without a struggle. But if *caesia* be the dominant species, as this situation would suggest, what are the influences bearing upon its selection of the more arid areas where the two co-exist at the same altitude, as in Greek Macedonia, leaving the "softer" areas to *hortulana*, whereas it is invariably *hortulana* which is banished to the less bounteous heights where the common territory is mountainous? And what of *caesia*'s apparent aversion to Crete and Samothrace?

In Cyprus, *caesia* has an initial advantage in arriving there regularly from 12 to 30 days earlier in the spring, but this seems scarcely adequate to explain its ultimate take-over of the entire island to the exclusion of *hortulana*.

I have been unable to find any record of an instance of aggressive behaviour between the two species. *Caesia* is unequipped with any equivalent to the robin's red breast by which to assert its claims, and voice seems to be the only means left at its disposal — recalling, too, that it sings habitually out of sight and from the least advantageous level. Maybe its song possesses some atavistic content intolerable to the ear of *hortulana*, a possibility which would involve interesting acoustical implications in relation to the marginal areas separating the two species vertically or

horizontally, as the case may be. Again, it may be that the "collective" song made possible by breeding in concentration is enough to cover a number of representative pieces of territory of sufficient extent to create a corporate claim to the whole.

Apart from the obvious desirability of more adequate documentation of *caesia* as a species, the uniqueness of its relationship with its near cousin would appear to justify of itself closer examination as a separate exercise.

An approach to an understanding of the phenomenon or, as a beginning at least, of the mechanism through which it operates, could be made along the following lines:

- (a) a ringing programme, to include nestlings, within a prescribed area with a view to establishing whether or not *caesia* appears to have special ties to its place of origin;
- (b) a field study of the two species where they are found together during the spring and autumn passages, with emphasis on the former, to include numbers, dates, feeding habits, songs, calls and behaviour;
- (c) the same details as in (b) above, as far as possible, from the marginal areas where the two species are separated by altitude or by biotopic factors;
- (d) much more detail, in the case of *caesia*, of feeding habits;
- (e) recording of *caesia* songs and the use of tonal microscopy to detect local "dialects", with the same object as in (a) above;
- (f) examination by similar means of the songs of both species to establish (1) if there be any essential common factor(s) within the considerable variations and (2) if such are detected, what differences exist between the two sets of common factors for the respective species;
- (g) oscillographs as a supplement to check on the results obtained under (e) and (f) above.

The habits of both species of breeding in concentrations would make most of these suggestions relatively easy of accomplishment, and Cyprus immediately comes to mind in relation to the information sought regarding *caesia* only, except in the case of (e) above where samplings from other areas — Corfu and Rhodes are equally accessible — would be desirable for purposes of comparison.

Summary

Emberiza hortulana and *E. caesia* are two closely related species whose social incompatibility while breeding appears absolute. Although the somewhat smaller of the two it seems to be *caesia* which dominates in the areas around the eastern Mediterranean where they meet. Records of individual sightings of *hortulana* on islands in this region occupied by

caesia in the breeding season (and vice-versa) probably relate to birds of passage only, as there is no authenticated record of breeding in any such case. A tentative programme of field and laboratory research, including ringing, field observation and bio-acoustical analysis is submitted as a suggested initial approach to a solution of the factors responsible for this exclusiveness.

Zusammenfassung

Die beiden nahe verwandten Ammern *Emberiza hortulana* und *E. caesia* schließen sich in ihrer Verbreitung zur Brutzeit vollkommen aus. Obwohl sie die etwas kleinere von beiden ist, scheint *E. caesia* im östlichen Mittelmeerraum dort, wo ihr Verbreitungsgebiet auf das von *E. hortulana* trifft, die überlegene Art zu sein. Ein Programm zur Untersuchung der Faktoren, die für das ausschließliche Vorkommen jeweils nur einer der beiden Arten verantwortlich sind, wird angeregt.

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